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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/687,522

10/15/2003

Edward J. Seppi

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23639

7590

10/02/2006

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EXAMINER

KISH, JAMES M

ART UNIT

PAPER NUMBER

3737

DATE MAILED: 10/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/687,522

Applicant(s)

SEPPI ET AL.

Examiner

James Kish

Art Unit

3737

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-55 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-55 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>4/9/04, 5/17/04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 4-5, 10, 13-14, 18 and 22-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Barrett (US Patent No. 3,801,785). Barrett discloses a system and method for two x-ray beams of different energy levels predominantly above and below the maximum absorption range of an agent in the object may be used to enhance contrast in a reproduced image, formed by subtracting the individual images (see Abstract). Since different distances produce different patterns, the data recorded on the film will contain three-dimensional data (column 4, line 62 through column 5, line 4).
2. Claims 1-2 and 11-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Hughes et al. (US Patent No. 4,432,370). Hughes discloses producing an x-ray image of a blood vessel by directing synchrotron radiation at first and second selected energy levels through the vessel, detecting the attenuated radiation and logarithmically subtracting the two signals. Also see column 2, lines 36-45, where digitizing the images is described. Other elements such as samarium or europium can be used as contrast agents (column 5, lines 60-64).

Art Unit: 3737

3. Claims 29-31, 36-40 and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Graeff et al. (US Patent No. 4,736,398). Graeff discloses an apparatus for the digital subtraction angiography in the energy subtraction mode. A computer subtracts the images obtained. It is merely necessary for the energy of ray E_1 to be just below and that of the other ray E_2 just above the iodine absorption edge (see Abstract).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 6-9, 17, 19-21, 24-28, 48-50, 53-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barret alone. Barret discloses a system and method for two x-ray beams of different energy levels predominantly above and below the maximum absorption range of an agent in the object may be used to enhance contrast in a reproduced image, formed by subtracting the individual images (see Abstract). Since different distances produce different patterns, the data recorded on the film will contain three-dimensional data (column 4, line 62 through column 5, line 4).

With regard to claims 6-9, 48-50 and 53-54, the method of claim 1 relies on images taken of a body while a contrast agent with a known k-edge is present, generating two sets of image data and subtracting the two datasets. There are no

Art Unit: 3737

features critical to any one imaging modality. Therefore, it would be obvious to one of skill in the art of imaging to use MRI, PET, any beam-shaped x-ray imager, or any other device that produces radiation for imaging.

With regard to claims 17, 19-21 and 24-28, it would be obvious to one having ordinary skill in the art to use any one of a plurality of known methods to generate radiation at different energy levels. These would include using different materials for the anodes/targets, filtering the radiation, or varying the voltage used to bombard the anode/target.

5. Claims 32-35, 43 and 45-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graeff et al. alone. Graeff discloses an apparatus for the digital subtraction angiography in the energy subtraction mode. A computer subtracts the images obtained. It is merely necessary for the energy of ray E_1 to be just below and that of the other ray E_2 just above the iodine absorption edge (see Abstract).

With regard to claims 32-35, the method of claim 29 relies on images taken of a body while a contrast agent with a known k-edge is present, generating two sets of image data and subtracting the two datasets. There are no features critical to any one imaging modality. Therefore, it would be obvious to one of skill in the art of imaging to use MRI, PET, any beam-shaped x-ray imager, or any other device that produces radiation for imaging.

With regard to claims 43 and 45-47, it would be obvious to one having ordinary skill in the art to use any one of a plurality of known methods to generate radiation at

Art Unit: 3737

different energy levels. These would include using different materials for the anodes/targets, filtering the radiation, or varying the voltage used to bombard the anode/target.

6. Claims 3, 15-16, 51-52 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barret in view of Trauernicht (US Patent No. 5,629,968). Barret discloses a system and method for two x-ray beams of different energy levels predominantly above and below the maximum absorption range of an agent in the object may be used to enhance contrast in a reproduced image, formed by subtracting the individual images (see Abstract). Since different distances produce different patterns, the data recorded on the film will contain three-dimensional data (column 4, line 62 through column 5, line 4). However, there is no discussion of the manner in which the images are initially detected. Trauernicht discloses an apparatus and method for obtaining radiographic images of an object. Figure 3 shows two detectors separated by a beam stop device. The first detector receives the entire radiation dose. The beam stop "deactivates" certain lines of the second detector by not allowing those radiation beams to pass through it. These two images may be combined in registration to provide a composite image of enhanced quality relative to that of the two components (column 5, lines 8-23 and lines 44-49). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a beam stop, as taught in Trauernicht, in the system of Barret to prevent certain lines of radiation to proceed to a detector in order to gain a composite image with enhanced quality.

7. Claims 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graeff et al. in view of Trauernicht. Graeff discloses an apparatus for the digital subtraction angiography in the energy subtraction mode. A computer subtracts the images obtained. It is merely necessary for the energy of ray E_1 to be just below and that of the other ray E_2 just above the iodine absorption edge (see Abstract). However, there is no discussion of the manner in which the images are initially detected. Trauernicht discloses an apparatus and method for obtaining radiographic images of an object. Figure 3 shows two detectors separated by a beam stop device. The first detector receives the entire radiation dose. The beam stop "deactivates" certain lines of the second detector by not allowing those radiation beams to pass through it. These two images may be combined in registration to provide a composite image of enhanced quality relative to that of the two components (column 5, lines 8-23 and lines 44-49). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a beam stop, as taught in Trauernicht, in the system of Graeff to prevent certain lines of radiation to proceed to a detector in order to gain a composite image with enhanced quality.

Art Unit: 3737

Conclusion

Other related art:

Keyes et al. 4,482,918

Umetani et al. 4,890,310

Ueda et al. 4,945,552

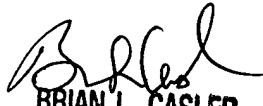
Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Kish whose telephone number is 571-272-5554.

The examiner can normally be reached on 8:30 - 5:00 ~ Mon. - Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMK


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